

Pre-Lab Reading:

After a solute, such as salt, dissolves in water, the salt is gone, right? NO! It is said to be "in solution". A **solution** is a mixture that is completely uniform throughout. In water, the salt crystals dissolve by separating into ions, which are on the atomic level. These ions become uniformly "mingled" with water molecules, producing a **homogeneous** mixture, one that is uniform throughout.

Water mixtures are classified according to the size of particles dispersed in the water.

**Suspensions** are mixtures containing relatively large, easily-seen particles. The particles remain suspended for a while after stirring, but then settle out or form layers within the liquid. Suspensions are classified as **heterogeneous** mixtures because they are not uniform throughout. Muddy water is a good example of a suspension: if the water sits, after time, the dirt will settle out. *In a suspension, the component particles are much larger than in a solution.*

Particles of a size *between* those in a solution and those in a suspension are called *colloidal*. A **colloid** is a mixture of water that contains colloidal particles. The properties of colloids differ from those of solutions and suspensions. Many colloids are cloudy or milky in appearance but look clear when they are very dilute. Unlike a suspension, the particles in a colloid are not large enough to settle out. Homogenized milk is an example of a colloid.

Colloidal mixtures exhibit the **Tyndall effect** -- the scattering of visible light in all directions. You can see a beam of light passed through a colloid just as you see a sunbeam in a dusty room. Suspensions also exhibit the Tyndall effect, but solutions never do.

Answer these questions before starting the lab:

1. How is a suspension different from a colloid?
2. How is a solution different from a colloid?
3. Which has the largest particle size, a solution, colloid, or suspension? \_\_\_\_\_
4. The Tyndall effect can be used to tell the difference between which types of mixtures?

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post-lab notes:

# SOLUTIONS, COLLOIDS, AND SUSPENSIONS LAB

side 2

Name: \_\_\_\_\_

Purpose: To determine by observation if a given mixture is a solution, colloid, or suspension.

Obtain six vials, labeled "A" through "F." Two of the vials contain solutions, two contain colloids, and two contain suspensions. Your objective here is to determine, just by visual observations, which are which. Be sure to shake the vial for 5 seconds before making your observations. Do not open any of the vials. You may bring **three of the vials** (you choose) up to the laser beam to observe any Tyndall effect (very faint). Ignore any bubbles that you may see from having shaken the vials. Record your observations below for each of the vials, making sure to explain why you chose the answer that you did:

OBSERVATIONS	Solution, Colloid or Suspension?	EXPLANATION
<u>Vial A</u>		
<u>Vial B</u>		
<u>Vial C</u>		
<u>Vial D</u>		
<u>Vial E</u>		
<u>Vial F</u>		